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ABSTRACT

Based on an analysis of the trends in educational research, the paper presents a conceptual model, general trends, and areas of need in educational research. Following an introduction, a conceptual model is presented which helps readers visualize three sets of variables. Set 1 variables center around the educational influences of social class, home, school, and curriculum. Set 2 variables focus on the child's developmental stages and processes of learning, and set 3 variables deal with learning outcomes. In addition, a distinction is made between micro- and macro-level problems of teaching and learning. Next, trends of educational research are discussed. Major areas of research at the beginning of this century are related to the conceptual model and to current trends in research. Current trends include an increase in the study of complex interactions between social variables, learning processes, and outcomes; teaching processes, teacher behavior, and teacher effectiveness; individual differences (particularly those between underachievers and talented students); and measurement and evaluation of learning outcomes. There has also been an increase in methodolgical sophistication and input by other disciplines. Finally, major areas of need in educational research are identified, including the need to further understand social, cultural, and historical influences; consider non-cognitive learning outcomes; conduct more longitudinal studies; encourage greater communication of research findings; and keep pace with methodological and technical developments in research. (LH)

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N O T E

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EDUCATIONAL RESEARCH : A PERSPECTIVE

Dr. Shib K. Mitra

Introduction

Educational research has grown in diversity and volume over the last one hundred years, as a glance through Harris's *Encyclopedia of Educational Research* would show. To encompass in a brief paper what has required an encyclopedia, is a very difficult, if not a redundant, exercise. The aim of this paper, however, is very limited. It attempts to present a perspective on educational research, based on an analysis of the trends of educational research.

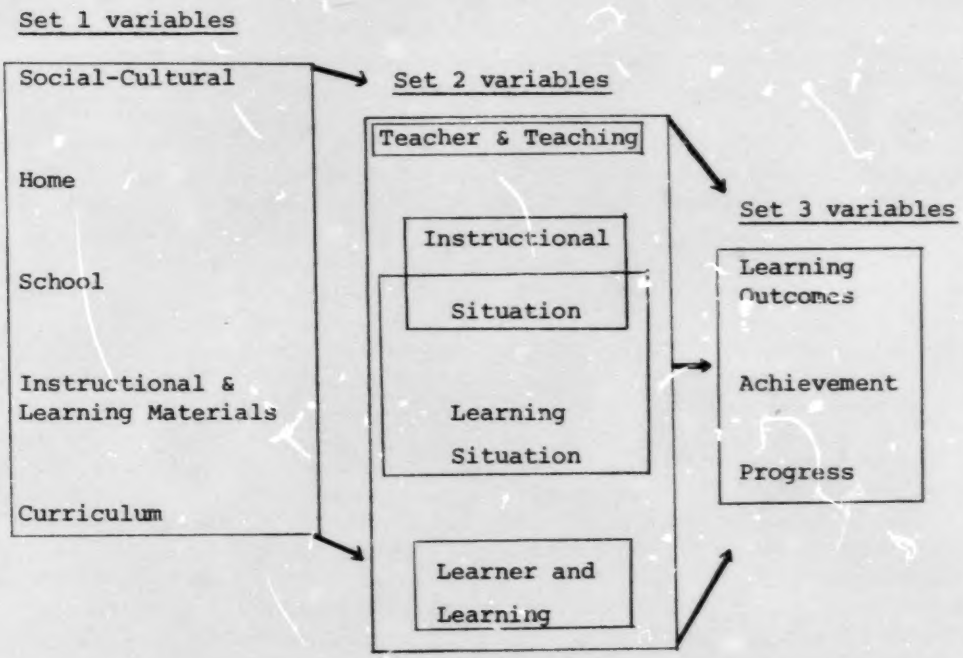
The linkage of research with social action is inherent in education. Educational research has been classified as: (1) fundamental research, (2) applied research and (3) action research (Best, 1977). This classification shows that the linkage between theory and practice in education is of prime concern, and, hence, research moves from the realm of ideas to the arena of action, a characteristic which makes educational research more comparable to research in health and agriculture than in the pure sciences. How to strengthen the links between research and practice in order to improve general education is a live issue, and was the subject of a Unesco-sponsored International Colloquium held in Bucharest in November, 1980. The colloquium had noted that educational research is 'pluri-disciplinary' and that there are five main types of institutional structures for educational research: (1) university based research, (2) institutional research, (3) research units within governmental agencies, (4) research units within other organization, and (5) spontaneous research or innovation initiated at the school level by educators. This classification of institutional structures for educational research covers the largely academic research in the universities concerned mainly with theoretical issues, fundamental as well as applied research in the autonomous institutions of educational research and centres for curriculum development, which have emerged recently, policy and evaluation research linked closely to the operational requirements of governmental agencies and local bodies, and, finally, action research undertaken by teachers, administrators, and others. (Unesco, 1981)

Educational research is a relatively new field of work. The World Bank has noted: "The components of a research activity in education, as in other sectors, include trained and motivated personnel, an indigenous literature (manuals, techniques, previous evaluation), a base of general information, institutionalized procedures for collecting, processing, analyzing, storing and retrieving data - both quantitative and qualitative - a technical support staff, organizational arrangements for conducting research." (World Bank, 1980) As the analysis

shows, the development of educational research capacities within a country depends very much on the availability of the various components within the country, and their utilization in the institutional structures. As we know, such capacities and institutional structures, in the parts of the world covered by the Unesco's Regional Office of Education at Bangkok, have developed only during the course of the last two decades or so, e.g. the National Council of Educational Research and Training (NCERT) in India, the Korean Educational Development Institute (KEDI) in Korea, the National Institute for Educational Research (NIER) in Japan, the Australian Council for Educational Research (ACER) and the Curriculum Development Centre (CEC) in Australia, to name a few. There are problems associated with their growth and development, as institutional structures for educational research, and the problems relate to the components identified in the World Bank document as well as to the linkages between research and practice in education, noted by the Unesco sponsored International Colloquium in Bucharest, in 1980.

A Conceptual Model of Educational Research

In order to discuss the trends and issues in educational research meaningfully, a conceptual model of educational research is presented here. It is not a research paradigm; it only helps to visualize broadly the kinds of variables that have found place in educational research.



Three sets of variables are visualized. The concern of education has been, and still remains so, with the outcomes of the educational processes (Set 3). The outcomes have long-range effects, of various kinds, on the society. For instance, education gives a country its trained manpower, and as the number of such trained persons increases, they have cumulative effect on employment, productivity, GNP, social and cultural behaviour, etc. Macro-level researchers are typically concerned with learning outcomes from this point of view.

At the micro-level, however, educational research, right from the beginning, has been concerned with what the children are learning, here and now, and how well they are learning whatever they are learning. The questions of standard of achievement, and of specificity of achievement has attracted a good deal of educational research. In the model, therefore, this set of variables has been visualized as dependent variables, although in macro-level research these variables may be treated also as independent variables for economic analysis.

Originally, achievement was in the focus, and research on tests, examinations, underachievement, overachievement (including the gifted) and the correlates of achievement had received much attention. Subsequently, the study of learning outcomes, objectives and evaluation have become important. The concept of student progress in education is a recent development, and research on the assessment of the progress of students in a system over a period of time is a very recent development.

The other important set of variables in the model encompasses the independent variables in educational research (Set 1), some of which are alterable, but some are not. The interest of researchers in social class variable, and, of late, in cultural variables, has generated a number of research studies relating these variables to the outcomes. Starting with the measurement of outcomes, the researcher's attention has shifted to the 'why' of differences in outcomes. Home, school and such other variables have been methodologically considered as contributing to the total variance in achievement. The contribution of home variables to achievement has emerged as relatively more significant than school variables in Western countries. A recent paper from the World Bank, however, shows that in developing societies, the school may be more important. (Heyneman et al, 1981)

In between is the second set of variables, which, in a way, are concerned with the heart of the educational process, viz. teaching and learning. The model shows a partial overlap of instructional situation with learning situation, learning situation being wider. Thus, we find a good deal of educational research which focuses on the instructional situation in relation to social class, school, instructional materials, etc., on the one hand, and to achievement or learning outcomes, on the other. Similarly, educational research interest from the beginning has been and still continues to be, on the learning situation and its relation with society, home, school, etc., and with learning outcomes

and achievement. The teacher, his behaviour and methods have been shown in the diagram as outside the instructional situation, and likewise, the learner and learning processes have been shown outside the learning situation. This is to highlight the voluminous research that exists specifically on these two aspects of the teaching-learning situation.

This set of variables may be considered as intervening variables, although in many studies they are treated either as dependent or as independent variables. The vast research literature on the teacher, teaching behaviour, teaching methods and teacher affectiveness is growing rapidly. The equally voluminous literature on the learner, learning processes, learning theories, learning strategies is also an area of rapid development. The emergence of mastery learning and self learning, in recent times, shows very significant developments in educational research, and the concern for increasing the efficiency of the formal system as also the development of non-formal education and life-long learning systems is drawing the researchers' attention to the teaching-learning situation in relation to the inputs from Set 1 and the outputs of Set 3.

It should be remembered that the model does not reflect educational theory. It is a convenient way of looking at educational research. In theory, the variables interact and the flow is both ways, although the model implies a uni-directional flow. The model helps to understand the difficulties in conducting experimental research in education. There are too many variables for any effective control, either experimentally or statistically. Hence, most research work tends to use correlational and regression analysis, and research results in the hands of different researchers tend to vary.

Educational research is multi-disciplinary. There was a time when education was equated with pedagogy. But, since the last World War, education has developed at a rapid rate, and has changed its character from one concerned only with imparting of lessons to selected youngsters to one concerned with helping all and sundry to develop his potentialities throughout one's life. Hence, appropriately, it has been suggested that pedagogy should be replaced by andragogy. This point only illustrates that, as in matters of public health, so in matters of public education, the problems focus on the development of the total human being over a life time, and, thus, requires that the specialist perspectives of the various sciences should meet and interact in order to solve the problems. (Unesco, 1972)

Educational research operates at two levels: Macro and Micro. In most countries of the world there has been a rapid development in education at all levels. The increasing trend toward democratization, reflected in equalization of educational opportunities as a stated public policy in many countries, coupled with the rising aspirations of the people, have created pressures on the governments of the countries to expand educational facilities. Hence, the number of schools, colleges, universities and other types of educational institutions

has increased rapidly since 1950. The investment of public funds has also gone up. But the population growth in many countries has also been rapid, and there are many non-enrolled children, and there are dropouts, as well as adult illiterates. On the one hand, there is rising cost of education, on the other, there is a growing mismatch between education and employment. The question of efficiency is paramount with many governments faced with the problems of shrinking resouce availability for education, while the demand for education is mounting. There are many such problems which concern the total system of a country. Research on such macro-level problems is necessary and is being undertaken by some scholars as well as by some international agencies like the World Bank, Unesco, IDRC, OECD, etc. A recent publication of Coombs highlights some of these problems of educational development. (Coombs, 1981)

Typically, educational researchers are concerned with micro-level problems of teaching and learning which seek to identify the share of contribution of various factors to the learning outcomes. There are problems of curriculum development, preparation of instructional materials, development of teaching aids, techniques of evaluation, development of teaching methods, etc, which are concerned with either solving the practical problems of improving the quality of education, or increasing our knowledge and understanding of the process of education.

The distinction between the two levels of research is useful, because the theory and methodology of each level tend to be different, and require different kinds of expertise. The corresponding distinction in the field of health and agriculture is noticeable. Thus, on the one hand, research on the human brain, biochemistry, neurophysiology, and genetics in the context of schizophrenia, and epidemiology of the disorder and development of health care facilities, on the other, indicates the two levels of research in health. Similarly, in agriculture, the research in genetic engineering with new seeds, soil chemistry and fertilizer is one level, as against research on production, distribution, consumption and price level of food grains, for a given country, at a given time, as another level. The scientist who is competent in micro-level work is not necessarily competent in macro-level work, and vice versa. Thus, in educational research, planners and administrators, as well as international donor agencies are interested in macro-level educational research relating population growth, income distribution, employment generation with inputs, throughputs and outputs in education. Analysis of costs and returns is of importance in taking policy decisions regarding investment in different levels and kinds of education.

Trends of Educational Research

At the beginning of the century , when education began to be taken seriously as an emerging and new social science, there were four major foci of educational research: (1) Child Study, (2) School Survey, (3) Individual Differences and (4) Transfer of Training. The names of Hall, Claparede, Ayers, Binet, Meumann, and Thorndike are associated with

the early research in these four major areas. It is interesting to note that Child Study falls in Set 2, School Survey covers all the Sets, Individual Difference only Set 3, and Transfer of Training falls in Sets 2 and 3. Methodologically, longitudinal study of child development and identification of stages was begun early in educational research. The methodology of survey and of participant observation, developed in sociology and anthropology, was introduced through School Surveys. The study of measurement of standards of what the children are learning, the range of individual differences, the sources of individual differences, etc. came from developments in tests and measurement. The laboratory method of studying transfer of training introduced the methodology of experimental education in educational research. (Connell, 1981)

Over a period of time, educational research has continued to focus on child study. Piaget's discoveries of stages of cognitive development have, however, led educational researchers to study the relationship of some of the Set 1 variables such as social class, home, school, curriculum, etc. with child's developmental stage and processes of learning in Set 2, and relate both Sets to the third Set of variables concerned with learning outcomes.

From School Survey, interest has shifted to the social context of the school and its pupils. The growing knowledge in the field of sociology of education indicates how sociological methods of research are being used increasingly. The research in this area links up society and culture with school, home and curriculum. The interaction of variables in a complex net work is itself in focus, as well as the interaction of these variables with the learners in the second set and then to the third in terms of learning outcomes and achievements.

The new addition in the last fifty years is the study of teaching process, teacher effectiveness, teaching behaviour, etc. Otherwise, the stage was set in the beginning of the century.

Educational research has been concerned with the measurement of achievement and in understanding the factors which influence the same. Historically, as various countries had moved in the direction of industrialization, a need for providing primary education for all had been felt. Some countries had passed laws to make primary education free and compulsory, and many countries moved in the direction of increasing and equalizing the educational opportunities for all its citizens. As more and more children started coming to the primary schools run by the municipalities, corporations and local educational authorities, it soon became evident that all children were not learning at the same rate. Individual differences in the matter of achievement became a noticeable feature.

In the field of psychology, techniques were developed to study the nature and extent of these individual differences. The use of quantitative techniques became quite popular to study group differences as well as the variations within groups. The impact of intelligence

and aptitude tests was felt quite early in educational research. The question as to what proportion of school achievement can be ascribed to intelligence and aptitude has since then engaged the attention of educational researchers. The contribution of home variables vs. school variables to the variance of achievement scores is still a persistent problem of research. (Heyneman et al, 1981)

With the development of testing techniques in the field of psychology, it was possible to develop achievement tests in the field of education. One finds, therefore, that a great variety of achievement tests covering all stages of education and all subjects were developed by educational researchers. These tests were intended to not only measure how a student has learnt, but also the spread of individual differences in a class, and between schools. The use of achievement tests also drew the attention of the researchers to the problem of linking instructional objectives with learning outcomes as measured by tests. The question of the meaning of failure in terms of an absolute cut-off point in a distribution of examination marks has since then attracted the attention of educational researchers, and research in evaluation of learning outcomes is a matter of great interest.

The study of achievement has led to two other important questions in educational research, viz., what can be done educationally to help the underachievers, and, equally, what can be done educationally to develop the talented pupils. One finds in the literature on the subject considerable work on the concept and methodology of underachievement as well as research on its determinants and compensatory education. The study of the genius or the talented has at the same time attracted the attention of researchers. The study of underachievement has led to the development of studies in learning difficulties of those who are deprived and physically or mentally handicapped.

Educational research has been concerned with the influence of social factors on education. It is interesting to note that soon after the development of research interest in the study of achievement in schools was aroused, there was a good deal of interest in finding out the social, economic and cultural factors which impinge on learning in schools and, therefore, on achievement. Educational research became sociological. There were many studies to understand the influence of socio-economic variables, and studies on deprivation arising out of poverty were conducted. In the countries which were in the process of transformation from an agrarian to industrial society, the differences between the rural and urban children and their homes and cultural backgrounds attracted the attention of researchers in order to understand their influence on the achievement in schools. Educational research in the sociology of education has led to the development of an interest in the study of the homes of the children as well as the sociological characteristics of the teachers at various levels of education. Sociological studies of the student population who took advantage of the schooling facilities which were available, and the differences between the characteristics of the student population

attending public and private schools, not only led to educational research involving sociological theory, methodology and techniques, but also to questions of public policy. Thus, the question of political influence through the state policy in the arrangements of schooling of a country received the attention of researchers concerned with historical and comparative education.

Educational research has a long tradition of studying the teacher and his characteristics and has now focussed on teacher behaviour. It was apparent quite early in the history of education in the 19th century, as schooling became free and compulsory, and more and more teachers and pupils were getting involved in education, that not all teachers are successful in imparting instruction in the classroom. With a larger intake of teachers, a training system had to be developed in a country, and the question, naturally, was what kind of training will be appropriate for turning out good teachers. Since then, there have been a number of studies on the teacher with regard to their social background, abilities, qualifications, interests, skill, knowledge, personality and other traits. The question of selection of teachers, and whether there is an aptitude of teaching, have been persistent problems of research. The effectiveness of teachers has engaged the attention of many researchers, and one finds a large variety of research in this area. (IDRC, 1981)

There has been a shift in studies on teacher from a personality orientation to a behavioural orientation. It is teaching behaviour which is being studied by the researchers to understand the influence of various factors which impinge on the behaviour of teacher in a classroom. With the publication of Gage's *Handbook of Research on Teaching*, the process of teaching and teacher behaviour has emerged as a very significant area of educational research. It appears, as if, education as a science has at last found its unique focus viz. teacher and teaching. The shift away from learning, which was dominated by psychologists, is worth noting, because while the Unesco's internationally known report on *Learning To Be* has contributed largely in increasing the appreciation of the idea of life-long learning, and learning society, where the learning needs and the learner are at the centre, in educational research the emphasis has shifted to instruction, teaching and teacher behaviour.

The psychology of learning is an important area of educational research. Starting with Thorndike in the late 19th century, the study of how learning takes place, and precisely what is learnt, has been in the centre of educational research. The question of transfer of training had received early attention. Gradually, the question of effective learning became important as the psychology of forgetting and memory produced experimental results. Educational research was not so much concerned with fundamental work in this area, as with experimental manipulation of learning situation in classrooms, in order to help learners develop better retention and reproduction of what is learnt. Cognitive learning, mastery learning, programmed

learning and such other recent developments indicate the vitality of research in this domain.

Over the years, there has been an increasing sophistication in educational research. If one compares the early child studies with the studies which have appeared in the last two decades, one notices that there is much greater methodological sophistication. The variables are defined operationally, the instruments used are sharper, the techniques of observation have become more objective and aimed more precisely at observable behaviour, the designs of experiment allow greater degree of confidence in results, and lastly the statistical techniques take care of interlocking of several variables. This is generally true of the developments in educational research with respect to any variable or sets of variables. The influence of the computer and the developments in multivariate statistical methods and their programming, during the last ten years, have moved educational research, almost in a quantum jump, to a new level of sophistication. This itself is an opportunity and a challenge. It is an opportunity, for example, to develop out knowledge and understanding of the complex relationship that exists in educational research of the three sets of variables. But it poses a challenge because the researcher has to develop competences of a kind which in education was not a part of training programmes. The pluridisciplinary character of educational research noted by the Unesco International Colloquium is clearly evident in the field of child studies in relation to compensatory education programmes, assessment of student progress in relation to Set 1 and Set 2 variables, understanding of teaching-learning situation, and so on.

Developments in education have been influenced by research in other disciplines and fields of specialization. The International Commission of Education has noted ten years ago that education, both in theory and practice, has to undergo change because of discoveries in the sciences, technology and other fields. Thus, their report states "Recent illuminating research on the brain, progress in the theory of information, systematic work by language and psycho-technical institutes, results obtained in group psychology and by teams of cultural anthropologists models produced by system analysts and cybernetic[illegible]s and among the new acquisitions which often need little more than appropriate administrative machinery and information transfer in order to increase the efficiency of traditional school system." (Unesco, 1972)

Some Issues and Gaps

First, there is the question of priorities. Priorities in educational research are very often not clearly defined and widely shared among the researchers. Usually, priorities are decided by the researchers within each of the five types of structures of research mentioned earlier. Priorities need to be widely discussed and debated upon. But in order to meet this need, it is necessary to have reviews of research within each country. Such reviews may be shared across countries to identify

areas of common concern as well as the country-specific problems and issues. This will help develop perspectives in the matter of priorities in each area of research and for each of the five types of structures for educational research.

There is a gap in our knowledge in this region about the influence of social, cultural and historical forces on the school, teachers, methods of instruction, processes of learning and learning outcomes. In order to develop research in these areas, it is necessary to encourage participation of social scientists in educational research. This gap has implication for the training of educational researchers, who are, by and large, trained in the university departments of education.

There is much to be known about the non-cognitive learning outcomes in the countries in this region. There are theoretical as well as methodological issues in understanding the relationship of the three sets of variables in this matter. By and large, evaluation research is not very well developed in this region, and whatever research exists is concerned more or less with testing what has been found in the Western countries. But considering the history of civilization in this region, and the diversity of cultures, research on non-cognitive objectives and outcomes in relation to the school, home, learning processes, instructional situation and socio-cultural matrix of the country offers the possibility of developing new knowledge in education.

Longitudinal studies are generally neglected by researchers, because usually publication in journals takes precedence over genuine interest in research problems. But it is necessary to encourage the methodology of longitudinal studies of child development of individual schools and institutions, of teachers, of cohorts, of learners (handicapped, gifted, belonging to specific cultural groups, etc.), and of educational progress. Some institutions should specialize in such studies, and training facilities in longitudinal studies can also be developed there.

There is a need to encourage communication of research findings. Generally, educational research is published in the form of monographs and in the form of articles in journals. Such communication is read by other researchers in education, but not by social scientists, other scientists and technologists, except when a few of them might be interested in specific topics. In addition to publications of this kind, it is necessary to communicate research to administrators, planners, general educators, teachers and the like. The usual training of research workers in the universities does not cover development of skills of communication. The mass media provide an opportunity of dissemination of educational research ideas and result which should be utilized. But the research worker is usually not interested in learning the art of communication through the media.

Educational research has to keep pace with methodological advances and technological developments, such as in computers. Training in research methods is usually confined to the university departments of

education, concerned largely with the training of teachers. As part of a course leading to a degree, research methods do not receive that much attention. One usually gets a bird's-eye view of the methods and some acquaintance with simple statistical techniques. For Ph. D. students, regular courses in research methodology and technology should be organized to develop a high degree of competence in educational research. It has been noticed by many that the quality of research at the Ph. D. level suffers on account of a lack of a thorough grasp of research methodology to cover the developments in psychology, child development, sociology, economics, computer technology and the like. Research institutes may consider development of programmes of training in research methodology with a multi-disciplinary faculty.

Small experiments in education should be encouraged. Very often, such attempts are left to action researchers. But, small experiments with good design of experiment, if replicated, over time, by different researchers, at different places, can help in the development of our understanding of the processes of education in relation to social and cultural variables. Cost-wise such research is less costly, and the quality of observation is better because the researcher himself goes to the field and collects the data. In large sample statistical research, the research depends on questionnaires, and on the field investigators who collect the data through questionnaires. While random errors are taken care of by the large size and the sampling design, there is very often doubt about the reliability and usefulness of the data, because of the constraints imposed by the limitations of questionnaire as a technique and by the vagaries of respondent motivation. But training in experimental methods requires that the university department or the institute should have faculty engaged in actual experimental work or in participant observation of the anthropological variety.

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